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DISCUSSION PAPER SERIES

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# ABSTRACT

# Wealth, Portfolios, and Unemployment Duration*

We use administrative data on individual balance sheets in Denmark to document how an individual's financial position affects job search behavior. We look at the effect of wealth at the entry into unemployment on the exit rate from unemployment as well as the effect on the subsequent match quality. The detailed data allows us not only to distinguish between liquid and illiquid parts, but also to decompose each of them into assets and liabilities. The decomposition of wealth into these four components is key to understanding how wealth affects job finding rates. In particular, we show that liquid assets reduce the probability of becoming re-employed, but we do not see an effect of liquid liabilities or the illiquid wealth components, while interest payments speed up re-employment. The results on subsequent match quality in form of job duration and wages are mixed.

**JEL Classification:** J6, J64, J65

**Keywords:** non-employment duration, wealth composition, job search behavior

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# 1 Introduction

Understanding job search behavior of unemployed workers is key for many policy questions such as optimal unemployment insurance, workfare, hiring and firing policies, active labor market policies, etc. One component affecting job search behavior is self-insurance through savings.[1] In this paper, we show that, beyond the distinction between liquid and illiquid wealth, the decomposition of wealth between assets and liabilities is important to understand job finding rates. In particular, we find that only liquid assets affect job finding, while both illiquid assets and liabilities in general do not.

Decomposing net wealth by liquidity is not a new idea. The degree of liquidity of the workers' portfolios has indeed been shown to be important for a number of economic outcomes like consumption in general (Gross and Souleles, 2002) and the sensitivity of consumption to income shocks or the response to fiscal stimulus (Kaplan, Violante, and Weidner, 2014).[2] We confirm previous results showing that the distinction between liquid and illiquid wealth matters, but we go one step beyond distinguishing between different degrees of liquidity and show the importance of separating assets from liabilities in order to understand heterogeneity in job search behaviors.

It is often complicated to find data where labor market statuses and detailed individual financial information are provided. For that reason, evidence on the effect of wealth on the exit rate from unemployment is often focused on liquid wealth. For example, Card, Chetty, and Weber (2007) use a quasi-experiment based on a discontinuity in the eligibility to severance payments in Austria that creates liquidity shocks at the entry into unemployment and measures the effect of liquidity on the exit rate from unemployment. A transfer equivalent to two months of wages at the entry into unemployment is shown to reduce the exit rate by 10% around the discontinuity. Basten, Fagereng, and Telle (2014) use a similar setup by exploiting the same type of discontinuity in severance payments in Norway. They find that the severance payments increase average non-employment durations and lower the fraction re-employed after one year. The advantage of the approach used in the two papers, with respect to previous works, is that it solves the problem of endogeneity of the wealth variables by using a regression-discontinuity (RD) design. In our paper we cannot exploit such a discontinuity but, since we follow the same individuals over time, we rely on a fixed-effect approach combined with a very rich set of control variables.

In our detailed Danish population-wide data, we do not see any effect of total net wealth on the re-employment probability. However, this result hides important aspects of

[1] Early examples are Bloemen and Stancanelli, 2001 or Alexopoulos and Gladden, 2004.

[2] There is a whole literature on the impact of housing, the most prevalent illiquid asset, on job search and job choices (e.g. Munch, Rosholm, and Svarer, 2008, Coulson and Fisher, 2009, Winkler, 2011, Head and Lloyd-Ellis, 2012, Caliendo, Gielen, and Mahlstedt, 2015 or le Maire and He, 2018). In most countries one cannot easily borrow against real estate holdings which reduce their value in terms of insurance. In that case, being a home owner could actually reduce mobility on the labor market by increasing the adjustment costs implied by a job change.

how the different wealth components affect the re-employment probability. Decomposing net wealth, by degree of liquidity first and then by separating assets and liabilities, we find a significant effect of liquid assets on the probability of becoming re-employed after 12 months. Moreover, the effect for liquid assets is more pronounced for those with low levels of liquid assets. What is new to this paper, in comparison with Card, Chetty, and Weber (2007) and Basten, Fagereng, and Telle (2014) who only look at liquid assets, is that we study the impact of liabilities *per se*, both liquid (such as credit card debt and bank debt) and illiquid (such as mortgages) liabilities. We show that neither illiquid assets nor illiquid liabilities affect the re-employment probability after controlling for individual fixed effects, and the results for liquid liabilities are mixed but qualitatively small. On the contrary, interest payments to banks speed up job finding.

In that way, we complement a literature that has shown that net wealth, which is assets minus liabilities, is the key variable linking saving decisions and job search activities (e.g. Algan, Cheron, Hairault, and Langot, 2003, Lentz and Tranas, 2005, Rendon, 2006, Lentz, 2009, Lise, 2013, or Shi and Chaumont, 2017). This literature gives a simple explanation for the existing empirical evidence: In an environment with credit constraints, precautionary savings allow smoothing of consumption in case of unemployment shocks and thus affect the intensity of search effort and potentially the reservation job quality. These theoretical papers use net wealth instead of separating assets and liabilities because in a canonical model of precautionary savings, it is not optimal to borrow and keep low return liquidity at the same time. At odds with this prediction, Telyukova, 2013 states that a little more than a quarter of all US households have both credit card debt and liquidity at the same time, and, in the same way, we find in our data that 71% of the workers hold both liquid assets and liquid debt.[3]. Our paper provides new empirical evidence, in the job search context, that calls for understanding the impact of wealth heterogeneity on the cost of unemployment by separating assets and liabilities.

The paper proceeds as follows. Section 2 presents the data used for the estimations, and Section 3 outlines the empirical strategy. Section 4 analyzes the results and finally, Section 5 concludes.

# 2 Data

We use administrative register data from Denmark for the period 1997 to 2011 containing socio-demographic-, labor market-, and financial information. Our point of departure is the DREAM data set which records the primary public transfer to all individuals in Denmark each week. From this register we sample all individuals recorded as unemployed at least once. We use a narrow definition of unemployment and only sample those who

[3]80% of workers have both assets and debt at the same time, and almost everyone in the entire sample (99.6%) has either assets or debt. 71% hold both liquid assets and liquid debt, while 39% have illiquid assets as well as illiquid debt (44% have either illiquid assets or debt).

where not on other public benefits before the beginning of the current unemployment spell, i.e. those who are on unemployment benefit or social insurance and ready for the labor market.[4] We use this data set to later extract unemployment spells. We merge this data with daily job spell information from a matched employer-employee data set. Finally, these two data sources are combined with yearly socio-demographic information such as detailed information on wealth holdings, interest payments, hourly wages, public transfers, and background characteristics as well as household information. We use the public transfers together with unemployment spell data to create a variable for the unemployment benefit level, which is used as a key control variable.[5] We merge background information including financial information onto the unemployment spells using the information at the end of the year prior to the start of the unemployment spell.[6] The financial information is collected by the tax authorities, and there is very limited self-reporting. Most of the information is automatically reported by the banks, mortgage institutions etc. Thus, the data is considered to be of very high quality.

One of the main advantages of the data is the very detailed information on wealth. We know the portfolio composition of individual wealth and are able to split wealth into assets and liabilities for cash holdings, stocks and bond holdings as well as the cash value of properties owned by the individuals and the amount owed to credit institutions. We use this information to decompose assets and liabilities according to liquidity. The first measure is liquid assets which consist of bank deposits and stock and bond holdings. Second, we measure liquid liabilities as the amounts owed to credit institutions such as bank or credit card companies. The third measure we use is illiquid assets measuring the value of properties owned by the individuals.[7] Finally, illiquid liabilities measure bond debts primarily capture mortgage dept. We measure all these variables at the individual annual level. In the case where individuals live as a couple, we can separate the household wealth between the two and then control for the wealth of the partner in the estimation stage.[8]

This gives us a sample of 2,095,083 unemployment spells experienced by 1,175,438 individuals. Notice that 40.55% of individuals experience more than one unemployment

[4]Our definition of unemployment includes workers on unemployment benefit and social insurance if they are deemed ready for the labor market. It consists of the following: people on unemployment benefits ('Dagpenge, ledighed'), social assistance and ready to take a job ('Arbejdsmarkedsparate kontanthjælpsbrugere'), transitional benefits ('Overgangsydelse'), or special unemployment benefits ('Ledighedsydelse').

[5]Since UI benefits depend on previous wages, they are not the same for all workers although approximately 85 percent of workers receive the maximum level.

[6]In the robustness section, we show that our main results hold if we condition on unemployment that starts within the first six months of the year.

[7]The value of properties is based on public valuations which form the basis for property taxation. House and apartment values are updated every second year, and individuals can complain if they do not think that the valuation is fair. In general, the tax valuations are thought to be of good quality.

[8]We defined couples as both married and cohabiting couples. Cohabitation is very common in Denmark. In some cases (such as shared bank accounts) the wealth is owned equally, while in other cases (such as owning a house) the ownership is more explicit with one partner owning x percent and the other 1-x percent.

spell, while 90.69% of the individuals experience at most three unemployment spells during our sample period. Tables 1, 2, and 3 show background information, labor market and financial information, and information about the outcomes for the sample used in the main analysis which consists of 1,398,727 observations.[9]

Table 1: Descriptive statistics, background information

| | Mean | SD |
|---|---|---|
| *Personal characteristics* | | |
| Age | 38.01 | 11,50 |
| Female (%) | 38.60 | 48.68 |
| Single (%) | 41.60 | 49.29 |
| Married/cohabitating (%) | 58.40 | 49.29 |
| | | |
| *Education (%)* | | |
| Less than high school | 37.26 | 48.35 |
| High school/vocational education | 47.35 | 49.93 |
| College or more | 15.39 | 36.08 |
| | | |
| *Occupation (%)* | | |
| Unknown | 26.32 | 44.04 |
| Military | 0.62 | 7.85 |
| Management at highest level | 1.02 | 10.03 |
| Job requiring knowledge at the highest level | 5.74 | 23.25 |
| Job req. knowledge at the medium level | 7.58 | 26.48 |
| Office jobs | 6.60 | 24.84 |
| Sales/Service/Care | 8.88 | 28.46 |
| Job in agriculture, forrestry, fishing req. basic level knowledge | 1.25 | 11.12 |
| Craftsmanlike jobs | 16.86 | 37.44 |
| Process tech., maschine techm., transportation, construction | 11.06 | 31.36 |
| Other | 14.06 | 34.76 |
| | | |
| Number of observations | 1,398,727 | |

Note: All variables are measured the year before the beginning of the unemployment spell.

In Table 1 it can be seen that almost 39% of our sample are female, 58% are married or cohabiting with a partner, and 42% are singles. The percentage of singles is a bit higher in our sample compared to all individuals in Denmark for the same time period, where 35% are single and 65% are married or cohabiting. Almost half of our sample have a high school or vocational education as their highest attained education, and 15% have completed college or higher.

Table 2 provides information about the labor market attachment and financial outcomes for the individuals. The mean duration of unemployment is 18 weeks. Workers on

[9]The main sample used is those experiencing multiple spells and whose unemployment spell begins at least 12 months before the end of the sampling period.

average have 12 years of experience, and 75% are members of an unemployment fund. Average total income the year before the beginning of the unemployment spell is 225,000 DKK (34,500 USD) with 187,000 DKK (29,000 USD) coming from wage income.

Table 2: Descriptive statistics, labor market and financial information

| | Mean | SD |
|---|---|---|
| *Labor market attachment* | | |
| Duration of unemployment (weeks) | 17.74 | 21.22 |
| Member of an unemployment fond (A-kasse) (%) | 74.83 | 43.40 |
| Tenure in previous job (weeks) | 48.44 | 68.96 |
| Total experience | 12.40 | 9.16 |
| Experience gained, 1 year before U | 0.72 | 0.33 |
| Experience gained, 2 years before U | 0.69 | 0.36 |
| Experience gained, 3 years before U | 0.66 | 0.38 |
| Degree of unemployment, 1 year before U (%) | 12.09 | 18.70 |
| Degree of unemployment, 2 years before U (%) | 12.35 | 20.59 |
| Degree of unemployment, 3 years before U (%) | 12.96 | 21.89 |
| | | |
| *Other financial variables (in year 2000 DKK)* | | |
| Total income | 225,056 | 114,358 |
| Wage income, 1 year before U | 186,844 | 107,017 |
| Wage income, 2 years before U | 176,908 | 112,661 |
| Wage income, 3 years before U | 166,548 | 115,528 |
| Hourly wage, 1 year before U | 157 | 103 |
| Hourly wage, 2 years before U | 152 | 96 |
| Hourly wage, 3 years before U | 148 | 88 |
| | | |
| Number of observations | 1,398,727 | |

Note: All variables are measured the year before the beginning of the unemployment spell (except the duration of unemployment). All financial values are measured in 2000 DKK prices.

Our main outcome variable is the probability of being re-employed within the first 12 months after the unemployment spell begins, but we also check whether our results hold for different time horizons. As can be seen in Table 3, 82% of our sample become re-employed within the first 12 months after the unemployment spell begins.

Furthermore, we investigate the match quality of the job following an unemployment spell by looking at the probability that the first job after re-employment lasts at least one year, that the total employment spell after re-employment lasts at least two years, and also at the re-employment wage.[10] The probability that the first job after re-employment lasts at least one year is 31%, while the probability of the total employment spell lasting

[10]Job spell length refers to the length of the first job held after unemployment, while employment spell length refers to the length of the entire spell without breaks in employment. The employment spell can thus consist of several jobs.

Table 3: Descriptive statistics, wealth, and outcomes

| | Mean | SD | Within SD |
|---|---|---|---|
| *Fraction re-employed after (%)* | | | |
| 6 months | 69.42 | 46.08 | |
| 9 months | 77.94 | 41.47 | |
| 12 months | 82.42 | 38.06 | |
| 24 months | 90.49 | 29.34 | |
| 36 months | 93.32 | 25.15 | |
| | | | |
| *Match quality of job following unemployment* | | | |
| First job lasts at least 1 year | 31.16 | 46.31 | |
| Total employment spell lasts at least 2 years | 29.12 | 45.43 | |
| Re-employment labor income (monthly, year 2000 DKK) | 41,698 | 50,905 | |
| | | | |
| *Wealth variables (in year 2000 DKK)* | | | |
| Net wealth | 94,479 | 493,233 | 112,029 |
| Liquid wealth | -31,799 | 281,051 | 67,675 |
| Illiquid wealth | 163,033 | 450,259 | 101,031 |
| Liquid assets | 57,278 | 223,175 | 32,611 |
| Liquid liabilities | 89,077 | 195,133 | 48,250 |
| Illiquid assets | 343,446 | 646,110 | 146,328 |
| Illiquid liabilities | 180,413 | 330,061 | 85,455 |
| Positive interest payments, banks | 1,078 | 6,021 | |
| Negative interest payments, banks | 6,303 | 9,887 | |
| Negative interest payments, mortgage institutions | 10,238 | 16,508 | |
| | | | |
| Number of observations | 1,398,727 | | |

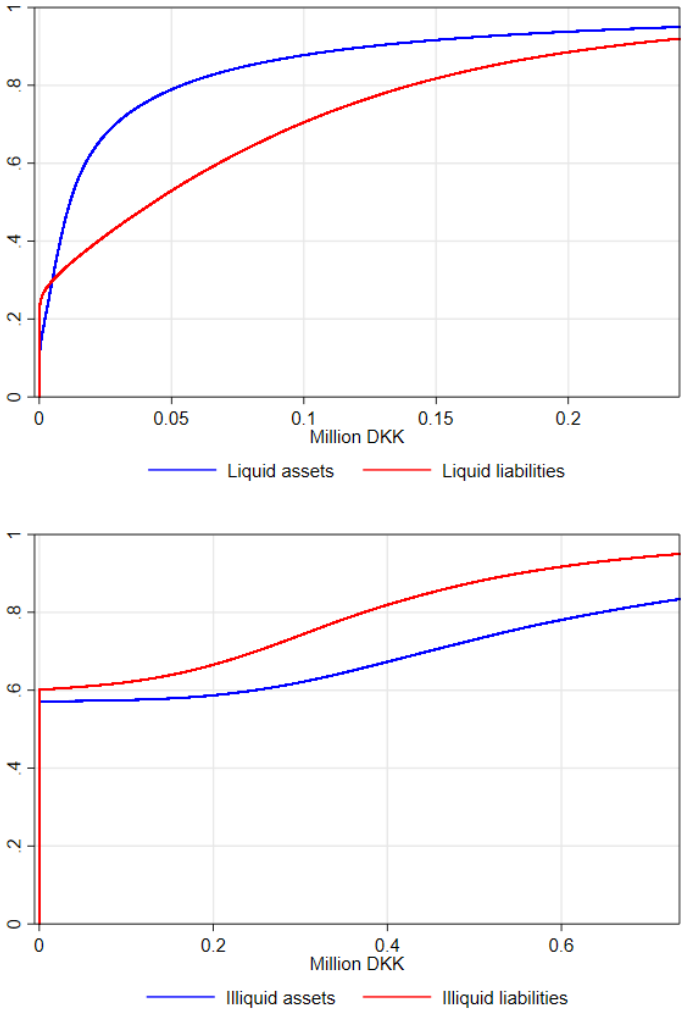
Note: Wealth variables are measured the year before the beginning of the unemployment spell. All financial values are measured in 2000 DKK prices. The third column ("Within SD") refers to within-person variation.

at least two years is 29%.[11] Mean re-employment wages are equal to 41,700 DKK (6,400 USD) monthly.

The mean amounts of liquid assets and liabilities are 57,000 DKK (8,800 USD) and 89,000 DKK (13,700 USD) respectively. A lot of the individuals have low liquid net wealth which lowers the mean. For the illiquid wealth components, the mean amounts of illiquid assets and liabilities are 343,000 DKK (52,700 USD) and 180,000 DKK (27,600 USD), respectively. A lot of individuals do not have any illiquid net wealth, but those who do tend to hold large amounts. Recall that this primarily reflects homeownership. On average, individuals receive 1000 DKK (153 USD) in interest payments from banks but pay 6,000 DKK (900 USD) to banks and more than 10,000 DKK (1,500 USD) to credit institutions.

[11] On average, the first job lasts a bit more than a year (58 weeks), while the total employment spell lasts almost two years (93 weeks).

FIGURE 1: DECILES OF WEALTH VARIABLES




Note: The figure shows the 10 deciles of the four wealth components separately. The top graph shows the deciles for liquid assets and liabilities, while the bottom graph shows the deciles for illiquid assets and liabilities.

Figure 1 gives more details about the distribution of the wealth variables. The first graph shows the 10 deciles of the liquid assets and liquid liabilities, and the second graph shows the same for the illiquid assets and liabilities. As can be seen from the figure, the distributions of the wealth variables are very different, as expected. Even the individuals in the first decile of the liquid asset distribution hold a positive amount (only 7.1% hold zero liquid assets), but the holdings of liquid assets are in general not large. A larger fraction has no liquid liabilities (22.6% have zero liquid liabilities), but the top 10% owe almost twice as much as the top 10% of individuals hold in liquid assets. For the illiquid components, a lot of individuals do not hold any positive or negative amounts, i.e. a lot of individuals are not home owners. 57.1% hold zero illiquid assets, while 60.1% have no mortgage debt. All wealth variables show considerable dispersion.

A main motivating question for this paper is whether job search behavior is affected

not just by total wealth, but by the portfolio of wealth. In a recent paper by Kaplan, Violante, and Weidner (2014) households are divided into hand-to-mouth (HTM), which are then split into wealthy HTM and poor HTM. Both groups do not have any net liquid wealth (liquid assets minus liquid liabilities), but only the wealthy HTM households hold positive amounts of illiquid net wealth. Empirically, it is not straightforward to measure the HTM-status of the individuals. If we follow the definitions by Kaplan, Violante, and Weidner (2014))[12], 61% of the individuals in our sample are HTM. Of these, 56% are poor HTM (no illiquid net wealth), while 44% are wealthy HTM (positive illiquid wealth). This is a higher share of HTM individuals compared to Kaplan, Violante, and Weidner (2014)[13] comes from the fact that our financial variables are measured at the end of December a high-spending period, and from our selected sample that only includes those who are unemployed at some point in the observation period. Another reason for this difference could be that it is easier to obtain overdraft facilities in Denmark than in the US or other countries.

# 3 Empirical strategy

Several previous studies have investigated the question of how individual wealth affects job search behavior using proportional hazard models or other models assuming that all unobserved heterogeneity is uncorrelated with observable characteristics. If this is not the case, the estimates will not be consistent. If for example individuals differ in their risk aversion, this is likely to be correlated with their wealth holdings. In this case, the hazard model would not be able to control for such differences, since it only controls for unobserved heterogeneity that is uncorrelated with the independent variables.

We prefer to control for constant unobserved individual heterogeneity that is potentially correlated with the independent variables. To do this, we perform an individual fixed effects estimation. We consider the following equation:

$$Y_{it} = \alpha_i + \gamma_t + f(z_{it}) + \delta x_{it} + \epsilon_{it} \tag{1}$$

where $Y_{it}$ denotes different outcome variables, e.g. the probability of being employed 12 months after initiating the unemployment spell, $\alpha_i$ is an individual fixed effect, $\gamma_t$ is year dummies, $z_{it}$ is the wealth holdings of the individual, $x_{it}$ contains the control variables, and $\epsilon_{it}$ is the error term.

[12]HTM individuals are those who are at their overdraft limit at the end of the period-pay and we define that limit to be the individual average monthly income. Because we observe liquid wealth on the first day of a pay-period in the data, HTM are those who have liquidity below their monthly income minus the overdraft limit. Given our definition, this turns up to be those who have negative net liquid wealth the 31st of December.

[13]They find that between 25 and 40% of US households are HTM with one-third being poor HTM and two-thirds being wealthy HTM. For Australia, France, Italy, and Spain the number of HTM is below 20% and still the share of wealthy HTM is larger than poor HTM.

Our main coefficients of interest are the effects of the portfolio composition, $z_{it}$, on job search behavior. Theory would suggest that individuals with higher wealth levels search less for a job, as they can use some of their savings to smooth consumption. This gives them more time to search for the best job, so besides affecting the unemployment duration directly, it could result in a better job match after unemployment.

A main threat to causal identification of the effects of the portfolio choices is selection; both into job search behaviors and wealth accumulation. As argued above, our estimation strategy eliminates any constant unobserved differences between individuals, but there could be other possible threats to the identification strategy.

In general, we would expect that selection would work in the opposite direction of economic theory. While economic theory would suggest that those with high levels of wealth would find a job at a slower rate, it is probably the case that these individuals have better unobserved labor market characteristics than those with low levels of wealth. Again, using a fixed effects approach takes care of part of this problem by comparing the same individual across different unemployment spells. However, it is still important to have very detailed controls for labor market quality of a given worker.

Our main outcome is the probability of being re-employed 12 months after the beginning of the unemployment spell, but we will also look at 6, 9, 24, and 36 months to check that the choice of 12 months does not drive the results. Appendix A investigates the effects of wealth on the probability of exiting unemployment instead of the probability of becoming re-employed. The results are quantitatively similar to those found using re-employment, but the effects are smaller.

Finally, differences in job search behavior might affect the quality of the resulting job match. To examine this, we proxy the quality of the job following an unemployment spell by looking at the probability that the job or employment spell lasts more than two years. We also look at the re-employment wage in the first job after unemployment.

# 4 Results

In the following, we estimate the effects of individual wealth on the job finding probability step by step. First, we distinguish between liquid net wealth (bank deposits and stock and bond holdings minus debt to credit institutions) and illiquid net wealth (value of properties minus mortgage debt). We proceed by splitting each type of wealth into assets and liabilities. We look at both linear and nonlinear effects of each of the components and include interest payments for each group. We look at the effect of wealth on the probability to become re-employed and on the match quality in terms of wages, job, and employment durations conditional on re-employment.

## 4.1 Decomposing Wealth

We estimate equation (1) where the outcome is the probability of being re-employed after 12 months. We allow the function of the wealth variables to have a dummy for zero and a linear and quadratic term. In the results presented in this section we only focus on the linear term, and in the next section we will go deeper into the nonlinear effects.

We begin by considering the effect of total net wealth. The first column in Table 4 shows that there is no significant effect of total net wealth on the probability of re-employment. This is a robust finding. We find no effects even if we re-estimate the model for different groups (by gender or marital status for example) or if we look at the probability to find a job after two or three years.

Notice that this is a very precisely estimated zero effect. A one standard deviation increase in total net wealth decreases the probability of finding a job by only 0.06 percent, and we reject effects lower than 0.46 percent at a 95 percent level. At first sight this result is surprising since it contradicts standard economic theory.

However, there are several possible explanations. First, it might be that even our multitude of control variables and using individual fixed effects are not enough to control for differences between individuals with different values of net wealth. In this case, we would expect that individuals with a high level of net wealth also have better unobserved labor market characteristics, which would bias the estimate in a positive direction. However, given our set of control variables, we think that this is only a small part of the explanation. Second, economic theory suggests that workers who are better able to smooth consumption find a job at a slower rate, since they put less effort into finding a job and because they accept fewer of the jobs they find. However, total net wealth might not be a good measure of the ability to smooth consumption. For example, if much of the wealth is illiquid, then accessing it will be costly. Thus, the effect of wealth on the probability of finding a job probably varies depending on the type of portfolio composition in terms of liquidity that the individual has access to.[14] As such, total net wealth is a poor measure for the ability to smooth consumption. Pooling liquid and illiquid net wealth thus renders the identification of any wealth effect very fragile.

In the second column in Table 4 we decompose total net wealth into liquid and illiquid net wealth. Interestingly, we find no effect of illiquid net wealth, but we do find a significantly negative effect of liquid net wealth on the probability of being re-employed one year after the entry into unemployment. Notice however that the estimated effect is still quite small with a one standard deviation increase in liquid net wealth decreasing the probability of re-employment by only 0.2 percent. This result is consistent with standard job search models where the cost of unemployment is higher for workers with lower levels of savings, since they cannot maintain consumption to the same degree as workers who

[14]For example, one strand of the literature has developed around the heterogeneity in the response to fiscal stimulus, see Kaplan, Violante, and Weidner (2014), Kaplan and Violante (2014), or Misra and Surico (2014)

Table 4: The effect of wealth on the probability to find a job within 12 months.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Total wealth | -0.001 | | | | | | | |
| | (0.002) | | | | | | | |
| Liquid wealth | | -0.006** | | | | | | |
| | | (0.002) | | | | | | |
| Illiquid wealth | | -0.002 | | | | | | |
| | | (0.002) | | | | | | |
| Liquid assets | | | -0.022*** | -0.026*** | -0.017*** | -0.016*** | -0.023*** | -0.022*** |
| | | | (0.004) | (0.003) | (0.002) | (0.002) | (0.002) | (0.004) |
| Illiquid assets | | | -0.003 | -0.018*** | -0.010*** | -0.007*** | -0.007*** | -0.003 |
| | | | (0.002) | (0.001) | (0.001) | (0.001) | (0.001) | (0.002) |
| Liquid liabilities | | | -0.004 | -0.000 | -0.002 | 0.006** | 0.002 | -0.004 |
| | | | (0.004) | (0.003) | (0.003) | (0.002) | (0.002) | (0.004) |
| Illiquid liabilities | | | 0.001 | -0.011*** | -0.019*** | -0.014*** | -0.015*** | 0.001 |
| | | | (0.004) | (0.003) | (0.003) | (0.002) | (0.002) | (0.004) |
| Observations | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 |
| Personal controls | x | x | x | | x | x | x | x |
| Labor market controls | x | x | x | | | x | x | x |
| Financial controls | x | x | x | | | | x | x |
| Individual FE | x | x | x | | | | | x |

Note: ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Results from estimations of Equation 1 using re-employment within the first twelve months as the outcome variable. Wealth variables are expressed in million DKK. Squared terms and zero dummies for the wealth variables as well as month and year dummies are added to all regressions. Personal controls: Age, age$^2$, female, single vs. married/cohabiting, educational level, benefit level proxy. Labor market controls: Experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years. Financial controls: Total income, wage income each year for the last three years, hourly wage each year for the last three years.

can use their savings as a buffer. This is the case in Lentz (2009), who finds a positive relationship between liquid net wealth and unemployment durations. In his model, this is a result of the search behavior of the workers as he finds that wealthier workers search less. Consistent with the results presented here, Lentz (2009) finds no significant effects of being a home owner.

Liquid and illiquid net wealth pool assets and liabilities in each category. Economically, the two can have very different effects. For example, two individuals with a total net wealth of 10,000 DKK where one has liquid assets worth 10,000 DKK and the other has 200,000 DKK in liquid assets and 190,000 DKK in liquid liabilities (debt to e.g. banks) are likely to have different accesses to credit. In that case, their ability to smooth consumption differs, and liquid net wealth can be misleading. Moreover, the distinction between assets and liabilities is necessary if the interest rates on liquid liabilities and on cash holdings or other liquid assets are different. Usually the interest rate on bank deposits is lower than the interest rate paid to credit institutions or on bank loans.

The third column in Table 4 provides results when assets and liabilities are separated for both the liquid and illiquid categories. As in column (1) and (2), we use our full set of controls. Again, in line with the job search theory, liquid assets have a significant and negative effect on the probability of being re-employed one year after the beginning of an unemployment spell. Job seekers with more liquid assets at the entry into unemployment have a lower probability of becoming re-employed, and the effect is almost five times what we found when using liquid net wealth. Because liquid net wealth pools liquid liabilities and liquid assets, an increase in liquid net wealth can come from a change in both sides of the worker's financial position, either an increase in the asset holdings or a decrease in liabilities. On the contrary, separating the two allows us to isolate the effect of an increase in liquid assets. Here, an increase in the amount of liquid assets by 1 million DKK/150.000 USD (one standard deviation) decreases the probability of becoming re-employed within the first year by 2.2 (0.5) percentage points. The result that higher liquid assets increase the time spent in unemployment is also found in the papers by Card, Chetty, and Weber (2007) and Basten, Fagereng, and Telle (2014). Both papers exploit a discontinuity in the eligibility to severance payments in Austria and Norway, respectively to create liquidity shocks at the entry into unemployment. In both papers, the increase in liquid assets increases the duration of non-employment. Table 4 shows that there are no significant effects of debt to banks and credit institutions (liquid liabilities), the value of properties (illiquid asset), or of mortgage debt (illiquid liabilities).

Columns (4) to (8) show the estimated coefficients where different sets of control variables as well as the individual fixed effect are added. Column (8) is the same as column (3). We show this to highlight the importance of using the fixed effect approach even after controlling for a vast set of observable differences. Looking at the effect of liquid assets, we see that once we control for personal characteristics, the effect is rather stable across specifications. For illiquid assets and illiquid liabilities, we see that the

effect of higher property value and higher mortgage debt both decrease when adding more control variables and vanish once the fixed effect is included in the regression. Not taking the unobserved, time-invariant individual heterogeneity into account would lead to different conclusions about the effects of these two variables. The effect of liquid liabilities disappears once all control variables are included. These results show that the inclusion of a vast set of control variables is important and furthermore, it is important to account for unobserved individual heterogeneity.

## 4.2 Nonlinear Effects Of Wealth

In the previous section, we investigated the linear effects of the different components of wealth on the probability to find a job. However, economic theory would suggest nonlinear effects to be important, as well as for example poor individuals would respond more than wealthy individuals to changes in the wealth components. To include this in the estimation model, we specify a linear spline for each of the wealth components. The knots are chosen in the following way. For each wealth component we create a knot at the 99th percentile, where the percentiles are taken over the non-zero values of that component. We then create intervals $(0, \overline{x}_{99}/5], (\overline{x}_{99}/5, 2\overline{x}_{99}/5], ..., (4\overline{x}_{99}/5, \overline{x}_{99}])$, where $\overline{x}_{99}$ is the value of the 99th percentile. Thus, we have 7 groups: One with zero, five in each of the intervals, and one group with values higher than the 99th percentile. We then create a spline with knots between the intervals and at the 99th percentile and add a dummy for zero. I.e. for liquid assets, $la_{it}$, we let

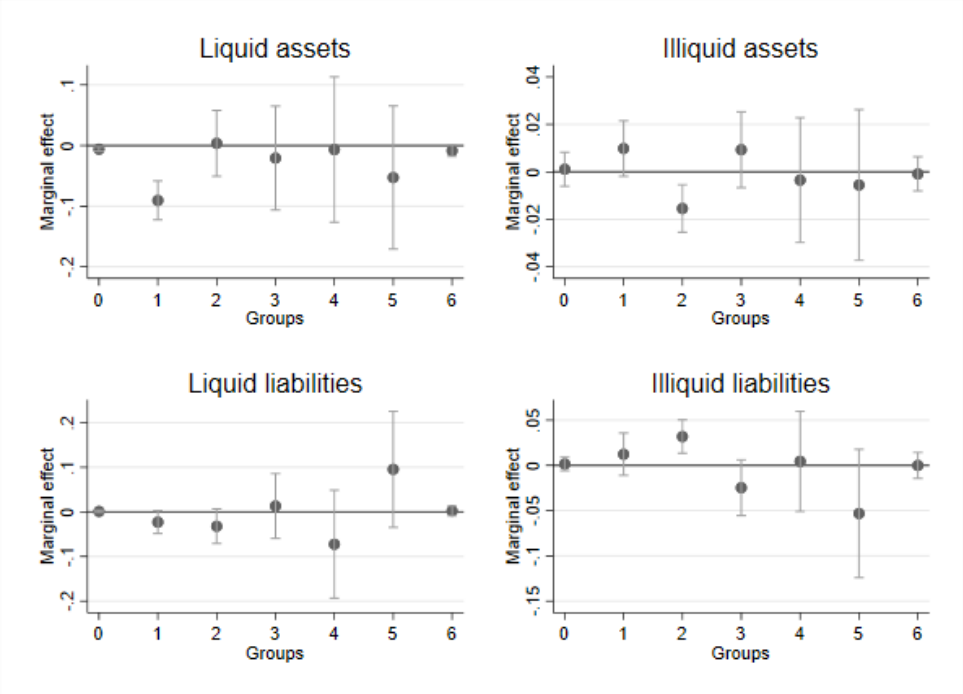
$$f(la_{it}) = \beta_0 \mathbb{1}[la_{it} = 0] + \beta_1 la_{it} + \beta_2 (la_{it} - \overline{la}_{99}/5)\mathbb{1}[la_{it} > \overline{la}_{99}/5] + ..... + \beta_6 (la_{it} - \overline{la}_{99})\mathbb{1}[la_{it} > \overline{la}_{99}] \tag{2}$$

where $\overline{la}_{99}$ is the value of the 99th percentile of liquid assets. Thus, the function is continuous except at the value zero, and the unit of measurement is again DKK million. We do the same for all four wealth components and estimate the same model as table 4, column (8), but with the nonlinear specification for the wealth components. Figure 2 plots the marginal effects for each group and 95 percent confidence bands. Notice, that for group 0 it is the effect of having zero of that particular wealth component.[15]

The first graph shows the results for liquid assets, and we see stronger marginal effects (in absolute value) at the bottom of the wealth distribution: for individuals with low levels of liquid assets, the effect of additional liquidity is higher in the sense that they tend to find a job with a lower probability. This is in accordance with standard economic theory where a small amount of liquid assets for people who are close to their borrowing constraint decreases the effort to get out of unemployment. It also decreases the acceptance probability as the additional assets increase the possibility for consumption

[15]Figure 3 in the Appendix shows the results when using dummy groups instead of the spline. The results show a similar pattern.

FIGURE 2: MARGINAL EFFECTS OF ASSETS AND LIABILITIES ON THE PROBABILITY TO BE RE-EMPLOYED BEFORE 12 MONTHS.




Note: This figure displays the estimated marginal effects and 95 percent confidence bands where the four wealth groups are split into groups. The outcome variable is finding a job in the first twelve months after the beginning of unemployment. Month and year dummies as well as individual fixed effects are added. All controls are added (age, age$^2$, female, single vs. married/cohabiting, educational level, benefit level proxy, experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years, total income, wage income each year for the last three years, and hourly wage each year for the last three years).

smoothing.

For the other three groups we find mixed evidence. There is a tendency that at low levels of liquid liabilities there is a marginally significant negative effect on the re-employment probability, but the effect is qualitatively small. One reason why we do not find that liquid liabilities matter for the re-employment probability could be that workers with better access to credit in general are granted bigger loans. Thus, the variable picks up two competing forces. First, the fact that the individual has a big loan in the bank means that the individual is more credit constrained and therefore should search more for a job. Second, since the individual was in the first place able to borrow in the bank, the individual might have better access to credit again because of unobserved heterogeneity. For both illiquid liabilities and illiquid assets we find no clear marginal effects.

## 4.3 Interest Payments

Besides the wealth components themselves, the possible interest rates earned or paid could also play a part. The size of a loan in itself might not be a good indicator of

the constraints on consumption. What really matters is the financial conditions of the loan, i.e. its duration and the required monthly payments, not the value of debt in itself. Following that idea, we introduce in our estimations three new variables; the interest payments on mortgage, the interest payments to financial institutions (that is on liquid liabilities), and the interest payments the worker receives from her liquid assets. As usual, the variables are defined the year before unemployment. Table 5 displays the results, where wealth enters linearly, interest payments are included in column (1)-(3), and the results where wealth enters nonlinearly and interest payments are included in column (4)-(6).[16] The first column of each specification shows the results without control variables, the second column adds control variables, and the third column further adds the individual fixed effect to see how that affects the results.

Table 5: The effects of interest payments on the probability to become re-employed within the first 12 months after unemployment begins.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | Linear wealth | | | Non-linear wealth | |
| Positive interest payments, | -0.028 | 0.131 | 0.168 | 0.018 | 0.154 | 0.202 |
| banks (liquid assets) | (0.119) | (0.107) | (0.136) | (0.110) | (0.107) | (0.132) |
| Negative interest payments, | 0.654*** | 0.080 | 0.244*** | 0.570*** | 0.013 | 0.363*** |
| banks (liquid liabilities) | (0.080) | (0.050) | (0.076) | (0.095) | (0.053) | (0.079) |
| Negative interest payments, | -0.262*** | -0.379*** | -0.043 | -0.240*** | -0.341*** | -0.122** |
| mortgage institutions (illiquid liabilities) | (0.042) | (0.040) | (0.058) | (0.044) | (0.042) | (0.059) |
| Liquid assets | -0.024*** | -0.025*** | -0.024*** | | | |
| | (0.003) | (0.003) | (0.005) | | | |
| Illiquid assets | -0.017*** | -0.008*** | -0.003 | | | |
| | (0.001) | (0.001) | (0.002) | | | |
| Liquid liabilities | -0.019*** | 0.001 | -0.011** | | | |
| | (0.003) | (0.003) | (0.005) | | | |
| Illiquid liabilities | -0.003 | -0.002 | 0.003 | | | |
| | (0.003) | (0.003) | (0.005) | | | |
| Observations | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 | 1,398,727 |
| All controls | | x | x | | x | x |
| Individual FE | | | x | | | x |

Note: ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. This table displays the results from estimations of Equation 1 using the probability of becoming re-employed in the first twelve months after the unemployment spell begins as the outcome variable. Wealth variables are as specified in equation (2). Interest payments are expressed in millions of Danish kroner. Month and year dummies are added to all regressions. Personal controls: Age, age$^2$, female, single vs. married/cohabiting, and educational level. Labor market controls: Experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years. Financial controls: Total income, wage income each year for the last three years, hourly wage each year for the last three years.

When the wealth components enter linearly, column (1) shows that higher negative

[16]For the nonlinear specification, only the effects of interest payments are shown in the table. The nonlinear effects of the four wealth components when interest payments are included can be seen in Figure 4 and 5 in the Appendix. The results do not change much compared to Figure 2 above and Figure 3 in the Appendix.

interest payments to banks increase the probability of re-employment, whereas mortgage interest payments decrease the probability. Adding our controls and the individual fixed effect removes the effect of mortgage payments, but the effect of interest payments to banks remains (column (3)). Comparing the effects of the wealth components here to those found in Table 4 (columns (4), (7) and (8)) shows that adding the interest payments does not affect the estimated coefficients of the wealth components much.

Turning to the nonlinear specification in Equation 2 (columns 4 to 6), we see that interest payments on liquid debt which reduces the resources available for consumption speed up the exit from unemployment. The estimated effect is sensitive to the inclusion of control variables and unobserved individual heterogeneity, but the effect remains significant. This is in accordance with economic theory, and it is worth noticing that this effect is an order of magnitude larger in absolute value than the effect of liquid asset. An increase of yearly interest payments by 1 million DKK (150.000 USD) would increase the probability of finding a job in the first year by 36 percentage points.

Interest payments on mortgage debt are found to have opposite effect (but only at a 5 percent level). The difference between the effect of interest rates on liquid and illiquid liabilities is interesting in itself. It could be caused by the fact that owning a house, which is almost always financed by a mortgage, reduces job finding rates, since geographical mobility is costly. This is consistent with empirical evidence on the effect of home ownership on job search (e.g. Munch, Rosholm, and Svarer, 2008, Head and Lloyd-Ellis, 2012, Caliendo, Gielen, and Mahlstedt, 2015, or le Maire and He, 2018).

## 4.4 Wealth Effects on Match Quality

We now turn to look at what happens after re-employment. The worker's financial wealth at the entry into unemployment can impact the next employment spell because it impacts the type of job a worker is willing to accept.[17] Empirically, the evidence is scarce. Using a quasi-experiment and Austrian data, Card, Chetty, and Weber (2007) find no evidence of match quality gains for workers who receive a positive liquidity shock at the entry into unemployment. The same is the case in Basten, Fagereng, and Telle (2016), using a lump-sum severance payment in Norway and finding no effects on the length of the new job or the re-employment wage. Confirming the elusive nature of the link between unemployment value and reservation wage/utility, the results on the effect of unemployment insurance generosity on reservation wages and job stability are also mixed (see references in Tatsiramos (2014)). One interesting exception is Luo and Mongey (2019) who find a positive effect of student debt on wage after graduation - a very particular type of debt at a very particular time in the career.

Table 6 presents the results for three measures of a job's match quality. The prob-

[17]Notice that, even in theory, this is not always true. If the marginal job arrival rates are the same in unemployment and employment, then the reservation wage simply equals the unemployment benefits (Lise (2013)).

Table 6: The effects of assets and liabilities on the match quality of the job following unemployment.

| | (1) First job above 1 year | (2) Re-employment spell above 2 years | (3) Re-employment wage |
|---|---|---|---|
| Liquid assets | -0.008 | -0.007 | -0.002** |
| | (0.007) | (0.007) | (0.001) |
| Illiquid assets | 0.001 | 0.006 | -0.001*** |
| | (0.003) | (0.004) | (0.000) |
| Liquid liabilities | -0.006 | -0.025*** | -0.000 |
| | (0.009) | (0.009) | (0.001) |
| Illiquid liabilities | 0.019** | 0.004 | 0.001* |
| | (0.008) | (0.008) | (0.001) |
| Observations | 846,244 | 798,596 | 881,900 |
| All controls | x | x | x |
| Individual FE | x | x | x |

Note: ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Results from estimations of Equation 1 using the probability of the first job accepted lasting 12 months or more, the probability of the re-employment spell lasting 24 months or more and the re-employment labor income as the outcome variables and controlling for individual fixed effects. Wealth variables are expressed in million DKK. Squared terms and zero dummies for the wealth variables, individual fixed effects as well as month and year dummies are added to all regressions. All controls are added (age, age$^2$, female, single vs. married/cohabiting, educational level, experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years, total income, wage income each year for the last three years, and hourly wage each year for the last three years).

ability that the first job accepted lasts more than one year, the probability that the re-employment spell (thus including job-to-job mobility) lasts more than two years, and finally the re-employment wage. Effects on the duration of the first job and on the duration of the entire re-employment spell are conceptually different. Indeed, if job-to-job mobility is risky, more liquid individuals might be more willing to change jobs and thus could have shorter durations in the first job after unemployment, but longer employment duration on average because they reallocate.

We find very mixed results. None of the variables of interest have an effect on all our three measures of a job's match quality, and only some have effects at a one percent significance level. However, if we concentrate on the most significant results, the picture is quite consistent with what we have already found. First, the value of the properties (illiquid asset) reduces the re-employment wage. Again, the effect is small but in accordance with the idea that being a home owner could actually reduce mobility on the labor market by increasing the adjustment costs implied by a job change (see Munch, Rosholm, and Svarer (2008), Winkler (2011), Head and Lloyd-Ellis (2012), Caliendo, Gielen, and Mahlstedt (2015)). Second, we find evidence that liquid liabilities could render re-employment spell more fragile since they decrease the probability for the spell to be above 2 years. Third, there is no effect of liquid assets on the probability of the first job

lasting at least one year or the employment spell at least lasting two years. This may seem surprising at first, but this lines up with the results found in Card, Chetty, and Weber (2007) and Basten, Fagereng, and Telle (2014): liquidity impacts exit rates, but not the match quality.

## 4.5 Robustness

In this section we show that our main results are robust to a number of choices that we have made.

**Timing of Job Finding** First, we investigate how important the choice of the outcome variable regarding the number of months before becoming re-employed is. As Table 3 showed, 69% of the sample are re-employed after 6 months, 78% after 9 months, while 82%, 90%, and 93% are re-employed after one, two, and three years. Table 7 shows the effect of the four wealth components on the probability of becoming re-employed after 6, 9, 12, 24, and 36 months. Notice that 12 months is the baseline as shown in Table 4 and that we only show the preferred specification with a full set of controls corresponding to column (3) in Table 4.

Table 7: The effects of assets and liabilities on the probability to have found re-employment after 6, 9, 12, 24, or 36 months.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Re-employed within (months) | | | | |
| | 6 months | 9 months | 12 months | 24 months | 36 months |
| Liquid assets | -0.029*** | -0.028*** | -0.022*** | -0.012*** | -0.008** |
| | (0.005) | (0.004) | (0.004) | (0.004) | (0.004) |
| Illiquid assets | -0.007*** | -0.007*** | -0.003 | 0.003 | 0.001 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Liquid liabilities | -0.009** | -0.006 | -0.004 | 0.005 | 0.005 |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Illiquid liabilities | -0.002 | 0.004 | 0.001 | -0.008** | -0.005* |
| | (0.005) | (0.004) | (0.004) | (0.003) | (0.003) |
| Observations | 1,440,899 | 1,426,558 | 1,398,716 | 1,293,248 | 1,161,330 |
| All controls | x | x | x | x | x |
| Individual FE | x | x | x | x | x |

Note: ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Results from estimations of Equation 1 using re-employment in the first 6, 9, 12, 24, or 36 months as the outcome variable. Wealth variables are expressed in million DKK. Squared terms and zero dummies for the wealth variables, individual fixed effects as well as month and year dummies are added to all regressions. All controls are added (age, age$^2$, female, single vs. married/cohabiting, educational level, experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years, total income, wage income each year for the last three years, and hourly wage each year for the last three years).

Generally, the choice of how many months after the beginning of the unemployment spell does not affect the results qualitatively. The negative effect of higher liquid assets is strongest for the probability of being re-employed after 6 months and then slowly drops from 2.8 percentage points to 1 percentage point after three years. As expected, these results indicate that the effect of initial wealth is decreasing as the duration of unemployment increases. When a worker has been unemployed for a longer period of time, the effect of wealth at the beginning of the unemployment spell diminishes. Higher illiquid assets decrease the re-employment probability the first month but doesn't seem to impact the re-employment probability after one year. There doesn't seem to be any convincing effects when considering liabilities.

**Heterogeneity Across Subgroups** We would expect that the results of wealth vary across subgroups. We have thus chosen to split on marital status, education, wage in last job, and home ownership. The results are shown in Table 8 where we re-do the estimations where the four wealth components enter linearly. Column (1) depicts the main results from Table 4 column (3).

The results in Section 4.1 do not control for the fact that individuals can pool risks within households. In practice, risk sharing within households is very common, and it is expected to have important consequences for consumption, income and labor supply, or the impact of social security (e.g. Ortigueira and Siassi (2013), Blundell, Graber, and Mogstad (2015), or Yum (2018) for recent references). However, there are few direct measures of how labor supply decisions are affected by spouse's wealth. Most of the papers generally pool wealth at the household level while, in principle, sharing is never perfect and can be subject to intra-household bargaining. Column (2) shows the results separately for singles, while (3) shows the results for married or cohabiting couples.

There is almost no difference between being single or married/cohabiting for the effect of liquid assets. For both groups the effect is almost the same as for the entire sample. The same is seen for the other wealth components where we do not see any significant differences. Turning to spouses' wealth, we find that if the spouse has a lot of liquid assets, then this decreases the probability of finding a job for the individual. A 1 million DKK (150.000 USD) increase in a spouse's liquid assets decreases the probability of re-employment for the worker by 0.7 percentage points, and a similar increase in the spouse's illiquid assets decreases the probability by 0.5 percentage points. Thus, the effects are lower than the direct effect of the worker's own liquid assets, indicating that wealth sharing among spouses is not perfect.

Next, we split the sample into three educational groups. The table shows that no matter the degree of education, liquid assets have a negative effect on the probability of becoming re-employed within the first year after the unemployment spell begins. Interestingly, the effect is highest for the low and highly educated groups. For either of these groups, a 1 million DKK (150.000 USD) increase in liquid assets decreases the probabil-

Table 8: The effects of assets and liabilities on the probability to be re-employed before 12 months for sub-groups.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Marital status | | | Education | | Wage | | Homeowner | |
| | All | Single | Married/cohab. | Low | Medium | High | Low | High | Yes | No |
| Liquid assets | -0.022*** | -0.023*** | -0.021*** | -0.030*** | -0.020*** | -0.027*** | -0.030** | -0.021*** | -0.008* | -0.060*** |
| | (0.004) | (0.008) | (0.005) | (0.010) | (0.006) | (0.008) | (0.013) | (0.005) | (0.005) | (0.014) |
| Illiquid assets | -0.003 | 0.004 | -0.004 | -0.012** | 0.007** | -0.004 | -0.006 | -0.004 | -0.004 | |
| | (0.002) | (0.004) | (0.003) | (0.005) | (0.003) | (0.005) | (0.007) | (0.003) | (0.003) | |
| Liquid liabilities | -0.004 | -0.010 | -0.007 | -0.000 | -0.008 | -0.009 | -0.015 | 0.000 | -0.012** | 0.004 |
| | (0.004) | (0.009) | (0.005) | (0.009) | (0.006) | (0.010) | (0.012) | (0.005) | (0.006) | 0.008 |
| Illiquid liabilities | 0.001 | 0.004 | -0.003 | 0.019** | -0.013** | 0.009 | 0.029** | -0.005 | -0.009** | 0.046 |
| | (0.004) | (0.009) | (0.005) | (0.010) | (0.006) | (0.009) | (0.012) | (0.005) | (0.005) | (0.031) |
| Spouse, liquid assets | | | -0.007** | | | | | | | |
| | | | (0.003) | | | | | | | |
| Spouse, illiquid assets | | | -0.005*** | | | | | | | |
| | | | (0.002) | | | | | | | |
| Spouse, liquid liabilities | | | -0.000 | | | | | | | |
| | | | (0.003) | | | | | | | |
| Spouse, liquid illiabilities | | | -0.004 | | | | | | | |
| | | | (0.003) | | | | | | | |
| Observations | 1,398,727 | 581,919 | 816,797 | 521,119 | 662,342 | 215,255 | 600,157 | 798,559 | 599,813 | 798,903 |
| All controls | x | x | x | x | x | x | x | x | x | x |
| Individual FE | x | x | x | x | x | x | x | x | x | x |

Note: ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Results from estimations of Equation 1 using re-employment in the first twelve months as the outcome variable. Wealth variables and interest payments are expressed in million DKK. Squared terms and zero dummies for the wealth variables, individual fixed effects as well as month and year dummies are added to all regressions. All controls are added (age, age$^2$, female, single vs. married/cohabiting, educational level, experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years, total income, wage income each year for the last three years, and hourly wage each year for the last three years).

ity of re-employment by around $2-3$ percentage points. On the other hand, for those with low or medium educations, both illiquid assets and illiquid liabilities now affect the probability significantly (but only at a 5% level). An increase in the property value increases the re-employment probability, whereas an increase in mortgage debt decreases the probability.

Splitting by pre-unemployment wages in columns (7) and (8) also affects the results. Those with hourly wages below the median before unemployment have a higher decrease in the re-employment probability compared to the rest. Furthermore, for the individuals with low wage, we see a positive effect of mortgage debt.

Finally, in columns (9) and (10) we split the sample by home ownership. Interestingly, the effect of liquid assets is primarily driven by non-homeowners.

**Changes in Sample** In Table 9, we show how the main results differ across different samples which are created to mitigate various concerns. Column (1) shows the full sample results.

The first concern is that individuals in our sample might have different potential lengths of unemployment insurance.

As an example, consider an individual who has an unemployment spell of a given length and then finds a job. The individual looses the job after a short period of time and has not become re-eligible for full unemployment insurance during the new unemployment spell. This implies that the effective potential length of the new unemployment insurance period is shorter than the maximum duration due to the initial draw on the length of the first unemployment spell. To alleviate this concern, we condition on short prior durations of unemployment in columns (2) and (3). This does not seem to matter much for the result.

Another concern is that there is a difference between when we measure the wealth variables and the start of the unemployment spell. This is due to the fact that wealth is only measured at an annual frequency in the registers. In particular, it is measured on 31 December each year. In column (4) we select only unemployment spells that started during the first six months of the year, such that wealth was measured closer to the beginning of the spell. This reduces the estimate, but it is still significant at a 1 percent level. Liquid liabilities also become significant at a 5 percent level.

Finally, we split the sample based on the business cycles. In column (5) we exclude observations from the Financial Crisis. This decreases the effect of liquid assets on job finding to -0.032. This indicates that during the Financial Crisis, liquid assets did not matter as much for job finding which could be caused by the overall deterioration of the job finding prospects.

Table 9: Robustness checks of main results.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | U during past 3 years | | U start | Business cycles |
| | Full sample | $< 6$ months | $< 18$ months | first 6 months | Excl. 2008Q2-2010Q3 |
| Liquid assets | -0.022*** | -0.015*** | -0.018*** | -0.014*** | -0.032*** |
| | (0.004) | (0.005) | (0.004) | (0.008) | (0.005) |
| Illiquid assets | -0.003 | -0.003 | -0.002 | -0.001 | -0.008*** |
| | (0.002) | (0.003) | (0.002) | (0.004) | (0.003) |
| Liquid liabilities | -0.004 | -0.008 | -0.003 | -0.019** | -0.013** |
| | (0.004) | (0.005) | (0.004) | (0.008) | (0.005) |
| Illiquid liabilities | 0.001 | 0.001 | 0.001 | -0.000 | -0.002 |
| | (0.004) | (0.005) | (0.004) | (0.008) | (0.004) |
| Observations | 1,398,727 | 955,444 | 1,326,251 | 419,342 | 1,007,196 |
| All controls | x | x | x | x | x |
| Individual FE | x | x | x | x | x |

Note: ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Results from estimations of Equation 1 using re-employment within the first twelve months as the outcome variable. Wealth variables are expressed in million DKK. Squared terms and zero dummies for the wealth variables as well as month and year dummies are added to all regressions. Personal controls: Age, age$^2$, female, single vs. married/cohabiting, and educational level. Labor market controls: Experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years. Financial controls: Total income, wage income each year for the last three years, hourly wage each year for the last three years.

# 5 Conclusion

This is one of the first papers to show that the portfolio *composition* of the unemployed workers affects their job search behavior. The decomposition of wealth into liquid and illiquid assets and liabilities is important to understand how wealth affects the exit rate from unemployment. In particular, we have shown that higher liquid assets decrease the probability of becoming re-employed within the first year after the beginning of the unemployment spell, and that the effect is quantitatively very different from the one found using net wealth. The effects are nonlinear in the sense that the marginal effect of liquid assets is more negative for low levels of assets as expected. Moreover, we find evidence that interest payments to banks, when coming from credit card debt or consumption credits, speed up re-employment.

The results are stable across educational levels, the pre-unemployment wage level as well as the marital status of the individuals. However, the results on liquid assets seem to be driven by non-homeowners.

As liquid assets prolonged the time spent in unemployment, we investigated whether this had any effect on the subsequent job match quality. This could be expected, as individuals with higher liquid assets could spend more time searching for the best job match while still maintaining a high consumption level. Similar to previous research on the subsequent job quality, we do not find any clear pattern of liquid asset on the match quality of the job after re-employment but some (quantitatively limited) negative effects for liquid liabilities.

Overall, these results offer a nuanced picture of the effect of wealth on job search. Both the decomposition by degrees of liquidity and the separation between asset, debt, and interest payments are important.

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# Appendices

## A Probability of Exiting Unemployment

In this appendix we will show how the results change when we use the exit from unemployment as the outcome variable instead of the re-employment probability. When looking at exiting unemployment, individuals can exit to the following states: Employment, Education, Retirement, Other public benefits, or Non-participation. The frequencies for each of the exit states can be seen in Table 10. The table shows that 62% exit to employment

Table 10: Exit states

| | Frequency | Percent |
|---|---|---|
| Employment | 858,194 | 61.36 |
| Education | 17,974 | 1.29 |
| Non-participation | 122,277 | 8.74 |
| Other public benefits | 398,174 | 27.82 |
| Retirement | 11,108 | 0.79 |

Note: The table shows the possible exit states after the unemployment spell ends.

whereas 28% exit to other public benefits. Notice that even if the individual exits to other public benefits, the individual could easily find a job later. In Table 11 we show the probabilities of exiting from unemployment within 6, 9, 12, 24, and 36 months as well as the probabilities for becoming re-employed (i.e. exiting to employment) from Table 3.

Table 11: Probability of exiting from unemployment within 6, 9, 12, 24, and 36 months.

| | Mean | SD |
|---|---|---|
| *Fraction exiting unemployment after (%)* | | |
| 6 months | 78.27 | 41.24 |
| 9 months | 88.35 | 32.09 |
| 12 months | 93.10 | 25.34 |
| 24 months | 99.10 | 9.42 |
| 36 months | 99.82 | 4.22 |
| | | |
| *Fraction re-employed after (%)* | | |
| 6 months | 69.42 | 46.08 |
| 9 months | 77.94 | 41.47 |
| 12 months | 82.42 | 38.06 |
| 24 months | 90.49 | 29.34 |
| 36 months | 93.32 | 25.15 |

Note: The table shows the probability of exiting from unemployment within 6, 9, 12, 24 and 36 months after the beginning of the unemployment spell.

As can be seen from the table, the fraction exiting unemployment before a given month is of course larger than the fraction exiting to employment. To have a comparable fraction of observations where an exit is observed, Table 12 shows the effect of wealth on the probability of exiting unemployment within 9 months after the unemployment spell begins. The fraction exiting unemployment after 9 months is 88%, whereas the fraction exiting to employment after 12 months which is the main outcome in Section 4 is 82%.

In Table 12 we replicate Table 4, but we use exiting unemployment as the outcome instead of finding a job.

Table 12: The effect of wealth on the probability of exiting unemployment within 9 months.

| | (1) | (2) | (3) |
|---|---|---|---|
| Total net wealth | -0.000 | | |
| | (0.001) | | |
| Liquid net wealth | | -0.000 | |
| | | (0.002) | |
| Illiquid net wealth | | -0.001 | |
| | | (0.002) | |
| Liquid assets | | | -0.012*** |
| | | | (0.003) |
| Illiquid assets | | | -0.001 |
| | | | (0.002) |
| Liquid liabilities | | | -0.013*** |
| | | | (0.003) |
| Illiquid liabilities | | | 0.001 |
| | | | (0.004) |
| Observations | 1,426,558 | 1,426,558 | 1,426,558 |
| All controls | x | x | x |
| Individual FE | x | x | x |

Note: ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Results from estimations of Equation 1 using exit within the first nine months as the outcome variable. Wealth variables are expressed in million DKK. Squared terms and zero dummies for the wealth variables as well as month and year dummies are added to all regressions. Personal controls: Age, age$^2$, female, single vs. married/cohabitating, and educational level. Labor market controls: Experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years. Financial controls: Total income, wage income each year for the last three years, hourly wage each year for the last three years.

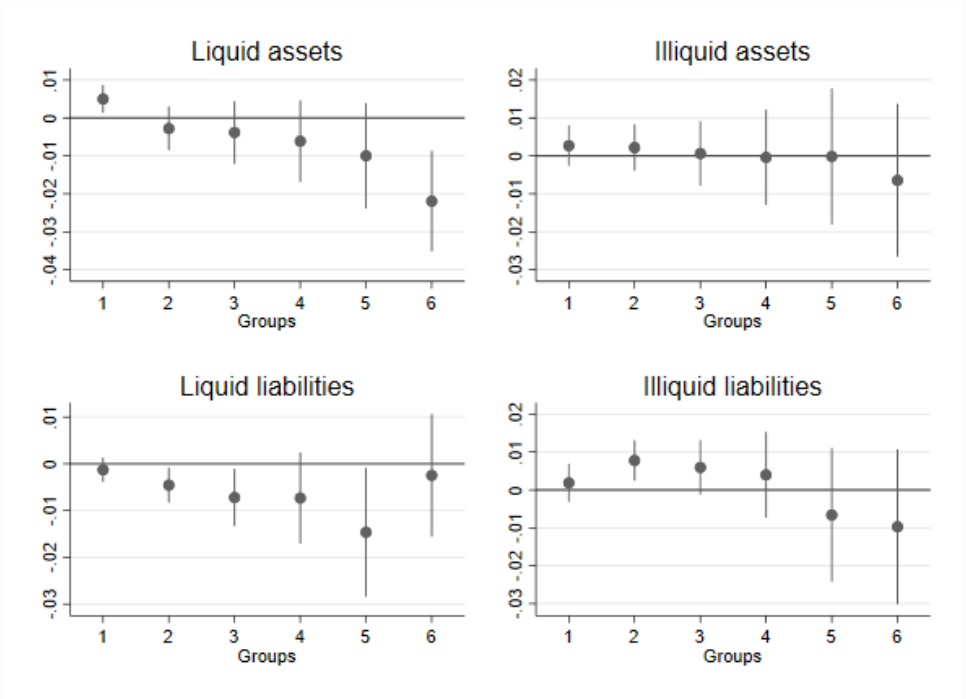
Table 12 shows no effect of total net wealth. This is similar to the results from Table 4. When splitting total net wealth into liquid and illiquid net wealth, no effect on the probability of exiting unemployment is found for either of these variables. In Table 4 we saw that there was a small but significantly negative effect of liquid net wealth on the probability of becoming re-employed. If we look at the effect of the four wealth components on the probability of exiting unemployment within the first 9 months, we see that there is a negative effect of liquid assets. This effect is smaller than the effect of liquid

assets on the probability of re-employment within 12 months, which was found to be 2.2 percentage points. Furthermore, Table 12 shows a negative effect of liquid liabilities on the probability of exiting unemployment. This is only significant at a 5% significance level though. In general, the effects of the wealth components on the probability of exiting unemployment are smaller than the similar effects of the wealth components on the probability of becoming re-employed, but qualitatively the results are similar.

# B Nonlinear Effects using Dummy Groups

This appendix shows the nonlinear effects estimating the same regression as for Figure 2, but using dummy groups instead of the spline. We show the results from this specification in Figure 3. Notice, that group 0, which is the reference group, and group 6 are special. Group 0 has zero of the wealth component, while the individuals in group 6 are those with an extreme amount, i.e. higher than the 99th percentile.

FIGURE 3: NONLINEAR EFFECTS OF ASSETS AND LIABILITIES ON THE PROBABILITY TO BE RE-EMPLOYED BEFORE 12 MONTHS USING DUMMIES.



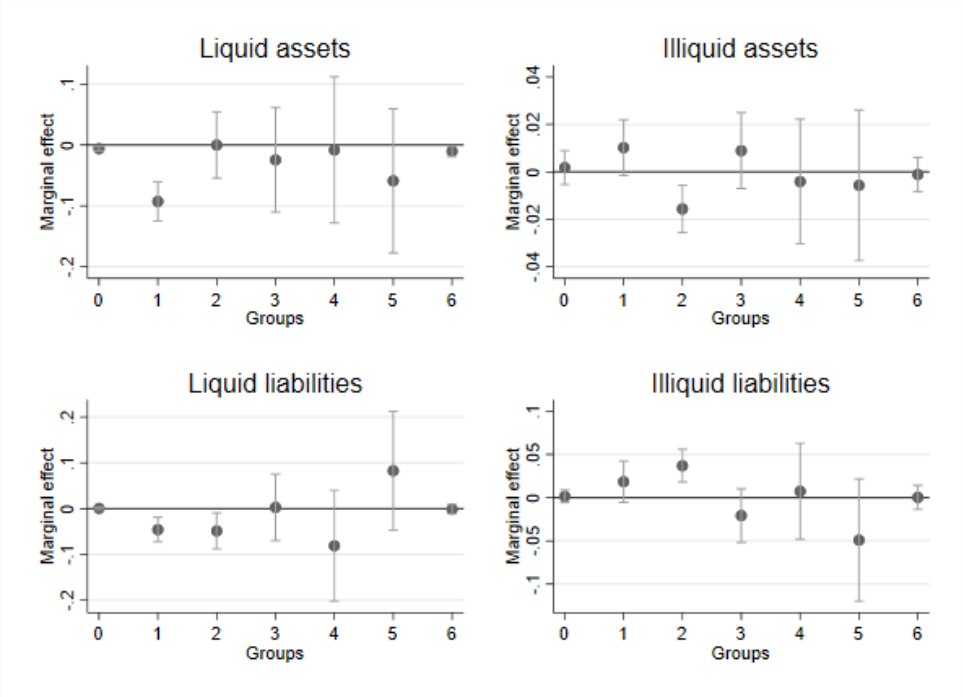

Note: This figure displays the estimated coefficients and 95 percent confidence bands, where the four wealth groups are split into groups, and dummies for each group are used. The outcome variable is the probability of becoming re-employed in the first twelve months after the unemployment spell begins. Month and year dummies as well as individual fixed effects are added. All controls are added (age, age$^2$, female, single vs. married/cohabitating, educational level, experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years, total income, wage income each year for the last three years, and hourly wage each year for the last three years).

Looking first at liquid assets, we again find a clear effect. The more liquid assets, the lower the re-employment probability, and the effect is clearly decreasing in the groups. For liquid liabilities we find a significant cumulative effect, i.e. having liquid liabilities in group 5 significantly decreases the re-employment probability compared to being in group 0. But the pattern is less clear than for liquid assets.

Again, for the illiquid variables we find no clear pattern.

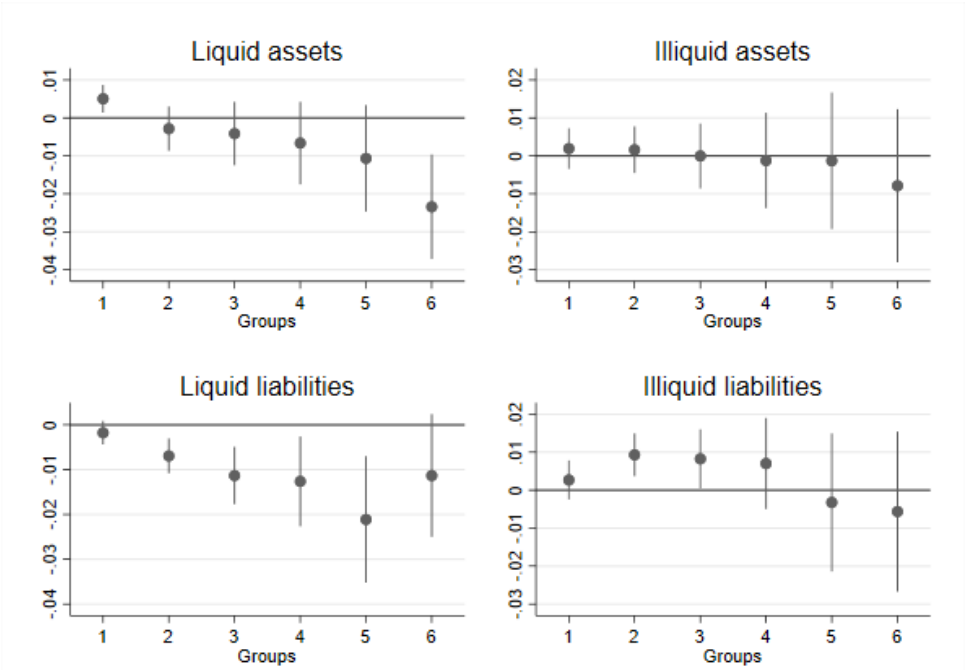
# C Nonlinear Effects Including Interest Payments

Figure 4: Marginal effects of assets and liabilities on the probability to exit unemployment before 12 months including interest payments.




Note: This figure displays the estimated marginal effects and 95 percent confidence bands, where the four wealth groups are split into groups. The outcome variable is finding a job in the first twelve months after the beginning of unemployment. Interest payments, month and year dummies as well as individual fixed effects are added. All controls are added (age$^2$, female, single vs. married/cohabitating, educational level, experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years, total income, wage income each year for the last three years, and hourly wage each year for the last three years).

Figure 5: Nonlinear effects of assets and liabilities on the probability to become re-employed within the first 12 months after unemployment begins using dummies and including interest payments.




Note: This figure displays the estimated coefficients and 95 percent confidence bands, where the four wealth groups are split into groups and dummies for each group are used. The outcome variable is the probability of becoming re-employed in the first twelve months after the unemployment spell begins. Interest payments, month and year dummies as well as individual fixed effects are added. All controls are added (age$^2$, female, single vs. married/cohabitating, educational level, experience, tenure in previous job, occupation, member of unemployment insurance fund, experience gained each year for the last three years, degree of unemployment each year for the last three years, total income, wage income each year for the last three years, and hourly wage each year for the last three years).